

PATENT COOPERATION TREATY

PCT

NOTIFICATION OF THE RECORDING
OF A CHANGE(PCT Rule 92bis.1 and
Administrative Instructions, Section 422)

From the INTERNATIONAL BUREAU

To:

BIRD, William
Bird Goën & Co.
Vilvoordsebaan 92
B-3020 Winksele
BELGIQUE

| | |
|--|---|
| Date of mailing (day/month/year) 27 September 2000 (27.09.00) | IMPORTANT NOTIFICATION |
| Applicant's or agent's file reference N1394-PCT | |
| International application No. PCT/EP99/09649 | International filing date (day/month/year) 08 December 1999 (08.12.99) |

1. The following indications appeared on record concerning:

☐ the applicant ☐ the inventor ☒ the agent ☐ the common representative

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State of Residence

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Teleprinter No.

2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:

☐ the person ☐ the name ☒ the address ☐ the nationality ☐ the residence

Name and Address

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State of Nationality

State of Residence

Telephone No.

32 16 48 05 62

Facsimile No.

32 16 48 05 28

Teleprinter No.

3. Further observations, if necessary:

4. A copy of this notification has been sent to:

| | |
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| <input type="checkbox"/> the International Searching Authority | <input checked="" type="checkbox"/> the elected Offices concerned |
| <input checked="" type="checkbox"/> the International Preliminary Examining Authority | <input type="checkbox"/> other: |

| | |
|--|--|
| The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35 | Authorized officer Catherine Massetti Telephone No.: (41-22) 338.83.38 |
|--|--|

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PATENT COOPERATION TREATY

PCT

From the INTERNATIONAL BUREAU

NOTIFICATION OF THE RECORDING
OF A CHANGE(PCT Rule 92bis.1 and
Administrative Instructions, Section 422)

To:

BIRD, William
Bird Goën & Co.
Vilvoordsebaan 92
B-3020 Winksele
BELGIQUE

Date of mailing (day/month/year)

12 April 2001 (12.04.01)

Applicant's or agent's file reference

N1394-PCT

IMPORTANT NOTIFICATION

International application No.

PCT/EP99/09649

International filing date (day/month/year)

08 December 1999 (08.12.99)

1. The following indications appeared on record concerning:



the applicant



the inventor



the agent



the common representative

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3. Further observations, if necessary:

4. A copy of this notification has been sent to:



the receiving Office



the International Searching Authority



the International Preliminary Examining Authority



the designated Offices concerned



the elected Offices concerned



other:

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Facsimile No.: (41-22) 740.14.35

Authorized officer

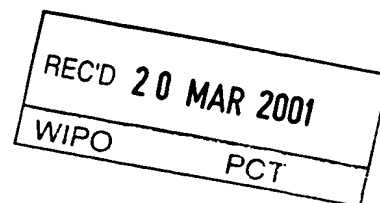
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PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

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| | | | |
|---|--|--|--|
| Applicant's or agent's file reference N1394-PCT | | See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416) FOR FURTHER ACTION | |
| International application No. PCT/EP99/09649 | International filing date (day/month/year) 08/12/1999 | Priority date (day/month/year) 18/12/1998 | |
| International Patent Classification (IPC) or national classification and IPC H04B7/005 | | | |
| Applicant NORTEL MATRA CELLULAR et al | | | |

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.



2. This REPORT consists of a total of 6 sheets, including this cover sheet.

- ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 5 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☒ Certain defects in the international application
- VIII ☒ Certain observations on the international application

| | |
|---|--|
| Date of submission of the demand 07/07/2000 | Date of completion of this report 16.03.2001 |
| Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465 | Authorized officer Helms, J Telephone No. +49 89 2399 2451  |

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/EP99/09649

I. Basis of the report

1. This report has been drawn on the basis of *(substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments (Rules 70.16 and 70.17).)*:

Description, pages:

1-20 as originally filed

Claims, No.:

1-32 as received on 08/01/2001 with letter of 29/12/2000

Drawings, sheets:

1/8-8/8 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/EP99/09649

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

| | | | |
|-------------------------------|------|--------|------|
| Novelty (N) | Yes: | Claims | 1-31 |
| | No: | Claims | 32 |
| Inventive step (IS) | Yes: | Claims | 1-31 |
| | No: | Claims | |
| Industrial applicability (IA) | Yes: | Claims | 1-32 |
| | No: | Claims | |

2. Citations and explanations
see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
see separate sheet

Re Item V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Reference is made to the following document:

D1: WO 97 40593 A (TELEFONAKTIEBOLAGET LM ERICSSON) 30 October 1997 (1997-10-30)

2. The subject-matter of **claims 1-31** meets the requirements of Art. 33(2) and (3) PCT with respect to novelty and inventive step.
 - 2.1 Independent **claims 1, 9, 17 and 25** are related to a telecommunications system, a base station transmitter and the corresponding methods of operating the system and the transmitter supporting compressed mode operation.
 - 2.2 Document D1, which is considered to represent the closest prior art, discloses also a telecommunications arrangement supporting compressed mode operation including one or more base station transmitters, means for interrupting transmissions and for temporarily increasing the power of transmissions and means for allocating the timings of transmission interruptions.

With respect to claims 1, 9, 17 and 25 D1 does not disclose that the allocating means is adapted to determine the power level/time characteristic of the currently planned future transmissions and to select the time for interrupting transmission based on the power/time characteristic.
 - 2.3 The skilled person would like to reduce the mutual interference within the system.
 - 2.4 This problem is solved by the distinguishing features of claims 1, 9, 17 and 25 mentioned above. Since these features are neither disclosed by the prior art nor obvious to the skilled person, the subject-matter of these claims can be acknowledged to involve an inventive step.

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/EP99/09649

- 2.5 **Claims 2-8, 10-16, 18-24 and 26-31** are dependent on **claims 1, 9, 17 and 25**, respectively, and as such also meet the requirements of the PCT with respect to novelty and inventive step.
3. The present application does not meet the requirements of Art. 33(2) PCT, because the subject-matter of independent **claim 32** is not new.

With respect to claim 32 document D1 discloses a telecommunications network operating in a compressed mode (see abstract). Since the compressed mode operation leaves an idle part of the frame (Fig. 3B), the compressed mode operation of the system disclosed in D1 is in fact suitable for saving battery power of one or more mobile terminals, e.g. by switching off the receivers during the idle part of the frame. Therefore, the disclosure of D1 deprives claim 32 of novelty (Guidelines III-4.8).

It is noted that the claim attempts to define the subject-matter in terms of the result to be achieved ("to save battery power of one or more mobile terminals") which merely amounts to a statement of the underlying problem and which is not suitable to limit the scope of protection.

However, it is further noted that the mentioned problem of saving battery power is considered to violate the requirements of the unity of the invention, because the other independent claims 1, 9, 17 and 25 solve the problem of reducing mutual interference within the system.

Re Item VII

Certain defects in the international application

1. Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the document D1 is not mentioned in the description, nor is this document identified therein.
2. Independent claims 1, 9, 17 and 25 are not in the two-part form in accordance

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/EP99/09649

with Rule 6.3(b) PCT, which in the present case would be appropriate, with those features known in combination from the prior art (document D1) being placed in the preamble (Rule 6.3(b)(i) PCT) and with the remaining features being included in the characterising part (Rule 6.3(b)(ii) PCT).

3. The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT)

Re Item VIII

Certain observations on the international application

1. The vague and imprecise statement in the description on page 19, line 31 and page 20, lines 3-5 implies that the subject-matter for which protection is sought may be different to that defined by the claims, thereby resulting in lack of clarity (Article 6 PCT) when used to interpret them (see also the PCT Guidelines, III-4.3/4.3a).

1. A telecommunications system which supports compressed mode operation, comprising:
 - 5 one or more base station transmitters for transmitting signals to a plurality of remote receivers;
means for interrupting transmissions from the one or more base stations transmitters to the plurality of remote receivers and for temporarily increasing the power of transmissions associated with these interruptions in accordance with compressed mode
 - 10 operation; and
means for allocating the timings of interruptions of transmissions to the plurality of remote receivers to optimise interference caused by the increased power transmissions.
2. The system according to claim 1, wherein the allocating means is adapted to
15 distribute the timings substantially evenly in time.
3. The system according to claim 1, wherein the allocating means is adapted to determine the power level/time characteristic of currently planned future transmissions and to select the time for interrupting transmissions based on the power/time
20 characteristic.
4. The system according to claim 3, wherein the allocating means is adapted to select the timing for interrupted transmissions based on finding a minimum in the power level/time characteristic or on a finding a timing at which the planned power level is
25 below a threshold power level within the determined power level/time characteristic.
5. The system according to claim 4, wherein the threshold power level is determined in accordance with a characteristic of the traffic density of transmissions.
- 30 6. The system according to any of claims 1 to 5, wherein the system is an FDMA, a TDMA a CDMA system or a combination of these.
7. The system according to any of claims 1 to 6, wherein the system is a radio mobile telecommunications system.

8. The system according to claim 7, wherein the interrupting means is adapted to provide compressed mode operation to remote receivers only when they are not in a soft handover.

5

9. A method of operating a telecommunications system which supports compressed mode operation and which includes one or more base station transmitters transmitting signals to a plurality of remote receivers, comprising the steps of:

10 interrupting transmissions from the one or more base station transmitters to the plurality of remote receivers and temporarily increasing the power of transmissions associated with these interruptions in accordance with compressed mode operation; and allocating the timings of the interruptions of transmissions to the remote receivers to optimise the interference caused by the increased power transmissions.

15 10. The method according to claim 9, wherein the allocating step includes distributing the timings substantially evenly in time.

20 11. The method according to claim 9 or 10, further comprising the step of determining the power level/time characteristic of current transmissions and selecting the time for interrupting transmissions based on the power/time characteristic.

25 12. The method according to claim 11, wherein the timing for interrupted transmissions is selected based on a minimum in the power level/time characteristic or on a planned power level below a threshold power level within the determined power level/time characteristic.

13 The method of claim 12, wherein the threshold power level is determined dependent upon a characteristic of the traffic density of transmissions.

30 14. The method according to any of claims 8 or 13, wherein the system is a CDMA mobile radio telecommunications system and compressed mode operation is only provided to remote receivers when they are not in a soft handover.

15. A base station transmitter for transmitting signals to a plurality of remote

receivers and which supports compressed mode operation, comprising: means for interrupting transmissions from the base stations transmitter to the plurality of remote receivers and for temporarily increasing the power of transmissions associated with these interruptions in accordance with compressed mode operation; and

- 5 means for allocating the timings of the interruptions of transmissions to the remote receivers to optimise interference caused by the increased power transmissions.

16. The base station transmitter according to claim 15, wherein the allocating means is adapted to determine the power level/time characteristic of current transmissions and to
10 select the time for interrupting transmissions based on the power/time characteristic.

17. The base station transmitter according to claim 15 or 16, wherein the system is a CDMA radio mobile telecommunications system and the interrupting means is adapted to provide compressed mode operation to remote receivers only when they are not in a
15 soft handover.

18. A method of operating a base station transmitter which supports compressed mode operation and which transmits signals to a plurality of remote receivers, comprising the steps of:
- 20 interrupting transmissions to the plurality of remote receivers and temporarily increasing the power of transmissions associated with these interruptions in accordance with compressed mode operation; and
- allocating the timings of the interruptions of transmissions to the remote receivers to optimise interference caused by the increased power transmissions.

25

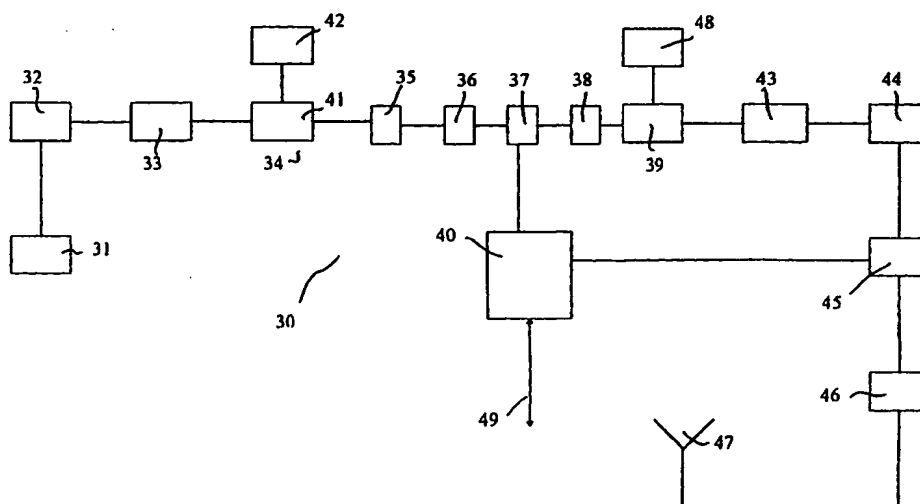
19. The use of compressed mode operation in a mobile radio telecommunications network to save battery power of one or more mobile terminals.



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

| | | | |
|---|--|--|---|
| (51) International Patent Classification ⁷ : H04B 7/005 | | A1 | (11) International Publication Number: WO 00/38349 |
| | | | (43) International Publication Date: 29 June 2000 (29.06.00) |
| (21) International Application Number: PCT/EP99/09649 (22) International Filing Date: 8 December 1999 (08.12.99) (30) Priority Data: 98403231.8 18 December 1998 (18.12.98) EP (71) Applicant (for all designated States except US): NORTEL MATRA CELLULAR [FR/FR]; 1, Place des Frères Montgolfier, F-78928 Guyancourt Cedex 9 (FR). (72) Inventors; and (75) Inventors/Applicants (for US only): LUCIDARME, Thierry [FR/FR]; 1, Allée Falconet, F-78180 Montigny-le-Bretonneux (FR). VINCENT, Paul [FR/FR]; 19, Allée Pierre Brussolette, F-92500 Rueil-Malmaison (FR). LESCUYER, Pierre [FR/FR]; 31, Rue de la Sourderie, F-78180 Montigny-le-Bretonneux (FR). (74) Agents: BIRD, William et al.; Bird Goën & Co., Termerestraat 1, B-3020 Winksele (BE). | | (81) Designated States: BR, CA, CN, JP, US, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i> | |

(54) Title: MOBILE COMMUNICATION SYSTEM AND METHOD OF OPERATING THE SAME HAVING COMPRESSED MODE OPERATION



(57) Abstract

A method and a telecommunications system supporting compressed mode operation is described in which this type of operation is used more frequently than previously known. To compensate for the reduction in reception quality caused by the interruptions to transmissions, the transmitted power may be increased. To prevent an unacceptable increase in interference, the timing and position in the frame of punctured slots is co-ordinated by the network. A transmitter (30) is described which includes a frame processor (37) controlled by a central processor (40). The central processor (40) also controls the power of a transmit power amplifier (45) and has sufficient intelligence to specify the optimum timing and position in a frame of a punctured slot to the frame processor (37) and to control the power amplifier (45) to increase the transmission power in that frame.

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 99/09649

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 H04B7/005

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H04B H04Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|------------|---|------------------------------|
| X | WO 97 40593 A (TELEFONAKTIEBOLAGET LM ERICSSON) 30 October 1997 (1997-10-30) | 1,2,6,7, 9,10,15, 18 |
| A | abstract | 4,5,8, 11-14, 16,17,19 |
| A | page 6, line 5 - line 18 page 19, line 2 - line 27 page 20, line 15 - line 21 GB 2 297 460 A (MOTOROLA) 31 July 1996 (1996-07-31) cited in the application abstract page 1, line 31 - page 2, line 5 page 3, line 7 - line 22; figure 1 | 1-19 |

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

26 May 2000

Date of mailing of the international search report

07/06/2000

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Authorized officer

O'Reilly, D

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP 99/09649

| Patent document cited in search report | Publication date | Patent family member(s) | Publication date |
|---|---------------------|----------------------------|---------------------|
| WO 9740593 A | 30-10-1997 | US 5883899 A | 16-03-1999 |
| | | AU 2718497 A | 12-11-1997 |
| | | BR 9708733 A | 03-08-1999 |
| | | CA 2252419 A | 30-10-1997 |
| | | EP 0895676 A | 10-02-1999 |
| GB 2297460 A | 31-07-1996 | AU 692055 B | 28-05-1998 |
| | | AU 4664396 A | 14-08-1996 |
| | | CN 1176717 A | 18-03-1998 |
| | | DE 69602078 D | 20-05-1999 |
| | | DE 69602078 T | 18-11-1999 |
| | | WO 9623369 A | 01-08-1996 |
| | | EP 0806097 A | 12-11-1997 |
| | | FI 973132 A | 28-07-1997 |
| | | JP 10512728 T | 02-12-1998 |